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Notes:

1. Untranslatable words are replaced with asterisks (***)�.
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CLAIM + DETAILED DESCRIPTION

[Claim(s)]

[Claim 1]In an optical recording medium pasted together and constituted by a pasting adhesive line which carried out a recording layer which provided a pair of substrates which consist of disk-shaped transparent plastics on at least one substrate inside, and was provided among a pair of substrates, An optical recording medium preparing for a side which made a protection layer which consists of an insoluble polymer membrane which carried out bridge construction insolubilization and formed a reactive resin mixture containing a pressure sensitive adhesive into a reactive resin ingredient adjoin a pasting adhesive line, and provided a recording layer at least.

[Claim 2]The optical recording medium according to claim 1, wherein a glass transition point of a homopolymer of the main composition polymer which all the composition of a pressure sensitive adhesive contains not less than 80% is 0 ** or less.

[Claim 3]The optical recording medium according to claim 2, wherein a pressure sensitive adhesive is either of a rubber system, acrylic, and a silicone series.

[Claim 4][in a reactive resin ingredient of a reactive resin mixture which forms a protection layer which consists of an insoluble polymer membrane] A pressure sensitive adhesive is contained 0.1 to 25%, The optical recording medium according to any one of claims 1 to 3 containing urethane diacrylate, saturation alkylene diethylene glycol diacrylate of the carbon numbers 2-6, and a bird acrylate derivative of TORIMECHI roll propane 75 in allweight % or more.

[Claim 5]The optical recording medium according to any one of claims 1 to 4, wherein a pasting adhesive line consists of applied type adhesives.

[Claim 6]The optical recording medium according to any one of claims 1 to 4, wherein a pasting adhesive line consists of an adhesive of pressure sensitive adhesive tape.

[Claim 7]When a substrate is fabricated by injection molding process using a ring-shaped

stamper and also a substrate is fabricated, [a stamper] It is fixed to a metallic mold of a making machine in a stamper control inner circumference mounting part, and the inner circumference side, [on a substrate] The Records Department is fabricated rather than a stamper control inner circumference mounting part at the perimeter side, and also adjoin the Records Department and the non-Records Department is fabricated at the perimeter side, The optical recording medium according to any one of claims 1 to 6 characterized by a thing of the non-Records Department of the perimeter side which adjoined the Records Department and the Records Department for which a pair of substrates are stuck in a field of until in part at least from inner circumference from a stamper control inner circumference mounting part.

[Claim 8]The near surface where a substrate is fabricated by injection molding process using a ring-shaped stamper, and a substrate irradiates with light of information used for read-out at least is flat, When fabricating a substrate, a stamper is what is fixed to a metallic mold of a making machine in a stamper control inner circumference mounting part in the inner circumference side, The optical recording medium according to any one of claims 1 to 7, wherein thickness of a substrate fabricated rather than a stamper control inner circumference mounting part at the inner circumference side is below thickness of a substrate fabricated rather than a stamper control inner circumference mounting part at the perimeter side.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention carries out the recording layer which provided a pair of substrates which consist of disk-shaped transparent plastics on at least one substrate inside, and relates to the optical recording medium pasted together and constituted.

[0002]

[Description of the Prior Art]When manufacturing optical recording media, such as an optical disc and a magneto-optical disc, an application or an adhesive is stuck on the protection coat applied on the recording layer so that the recording layer of the disc substrate of two sheets might become inside for adhesives, The method of pasting together by pressurizing, after piling up the disk of two sheets mutually is used.

[0003]

[Problem to be solved by the invention]However, after piling [how to paste the former together] up the disk of two sheets mutually, in order to pressurize and paste together, When the shape on the surface of a disk of the adherend to paste together has a projection like a barricade or a level difference is between the Records Department and the non-Records Department etc., it sticks with the applied adhesives or the adhesive of pressure sensitive adhesive tape, and an opening remains in a mating face easily. When the adhesion of the

surfaces of the disk pasted together to the applied adhesives or the adhesive of pressure sensitive adhesive tape is not enough, Air bubbles enter the field which the once stuck disk of two sheets separates and the part which separated sticks easily, and the problem that pasting with a uniform plane cannot necessarily be attained has occurred.

[0004]It becomes very remarkable when the part stuck especially creates the optical disc stuck from the internal surface by the side of the stamper of the stamper control of the stamper inner circumference mounting part which TATEBARI tends to generate to the disk surface.

[0005]Hold a pit and a groove like erasable DVD (digital versatile disk), and, [the optical recording medium with high storage density] It is necessary to press down the level of the jitter which is slight gap of the transmission signal in the noise, the time, or the phase which is a random electric signal generated according to the component parts of circuits, such as a drive for record of an inside-and-outside circumference, or the surrounding environment within the fixed range, and to lessen generating of errors. In order [for this reason,] to create a substrate by injection molding and to maintain the pit and groove from inner circumference to the perimeter in sharp fixed shape, the tool temperature at the time of substrate fabrication is raised, or mold clamp power of a metallic mold is enlarged, and the pit of a stamper and groove-shaped transfer nature are raised so that the pit of a stamper and the pattern of a groove may be made to transfer precisely -- if there is nothing, it will not become.

[0006]For this reason, if it is going to raise transfer nature, resin used for fabrication will enter between a nail of stamper control currently installed in a metallic mold of an inner circumference mounting part of a stamper, and a field by the side of a stamper, and a tendency which a barricade generates to a substrate and a horizontal direction becomes large. In order to take out a substrate from inside of a metallic mold, when opening the barricade a metallic mold, in order that a burr portion generated to the above-mentioned substrate face and a horizontal direction may receive and transform power into a substrate face and a perpendicular direction from an end facing the stamper side of stamper control at the substrate and opposite side, Convex TATEBARI will occur perpendicularly from a substrate face. and resin between the above-mentioned stamper and a nail of stamper control -- entering. Since the barricades on a convex hit when pasting together after coming to project TATEBARI on this convex highly from a substrate face and piling up a disk of two sheets mutually since it increases so that resin temperature in a metallic mold is high, a crevice between disks of two sheets becomes large, and an enter lump of air bubbles in the circumference increases, and uniform -- it will stick and **** will be difficult.

[0007]if a crevice between a stamper and a nail of stamper control is lost, a stamper is pressed down and it is made to fix -- resin -- entering, although it decreases, Inside temperature of a metallic mold in fabrication of a rewritable DVD with a repetition of a thermal excursion under fabrication of a between with a metallic mold control temperature of 120 **, [cylinder

temperature / of 380 ** / for metallic mold restoration] A time difference of a coefficient of thermal expansion in a contact portion arises, and since stamper control will hit a stamper for every molding cycle, it will be made to change into a stamper. Whenever this amount of modification repeats fabrication, it will become large, and it will become impossible for the machinery characteristic of an optical recording medium to get worse, and to maintain performance of an optical recording medium of fixed quality gradually, from it being transferred by substrate shape. An opening of a stamper and stamper control cannot be lost but this shows that generating of shape of a convex part of the Records Department of the stamper side of a substrate inner periphery by barricade generating is an inescapable phenomenon.

[0008]Therefore, [disk / in which the barricade of a convex part becomes large about the inside temperature of a metallic mold at the time of fabrication, or metallic mold mold clamp power a sake / on a transfer disposition / which does not obtain a raising colander / rewritable DVD] When it piles up, even if it is easy to take air bubbles into many openings when the interval of both substrates opens and performs the defoaming process back by decompression or heating like a subsequent press operator, the tendency for many air bubbles to remain is size. Even if it once pastes up, in the part where convex parts collide, the piled-up substrate interval becomes large, it exfoliates again and becomes easy to generate an opening, and it sticks and reservation of the smoothness of a disk becomes difficult.

[0009]When the smoothness of a disk side falls, **** acceleration increases and it becomes impossible to read the influence of smoothness, such as an optical disc and a magneto-optical disc, as a positive signal, in order to make it rotate at high speed, to irradiate the disk with a laser beam, to catch the reflected light and to read as a signal, when using a disk. Therefore, reservation of the smoothness in pasting serves as important SUBJECT.

[0010]This invention solves SUBJECT of this conventional technology, and it aims at obtaining the pasting optical recording medium which pasting which secured the smoothness of the disk can realize, even if a convex part is in a substrate inner periphery, when piling up the disk of two sheets.

[0011]

[Means for solving problem]The optical recording medium of this invention carries out the recording layer which provided a pair of substrates which consist of disk-shaped transparent plastics on at least one substrate inside, In the optical recording medium pasted together and constituted by the pasting adhesive line provided among a pair of substrates, The protection layer which consists of an insoluble polymer membrane which carried out bridge construction insolubilization and formed the reactive resin mixture containing a pressure sensitive adhesive into the reactive resin ingredient was made to adjoin a pasting adhesive line, and it prepares for the side which provided the recording layer at least.

[0012]As for a pressure sensitive adhesive, it is preferred here that the glass transition point of

the homopolymer of the main composition polymer which all the composition of a pressure sensitive adhesive contains not less than 80% is 0 ** or less. As such a material, it is preferred that it is either of a rubber system, acrylic, and a silicone series.

[0013][in the reactive resin ingredient of the reactive resin mixture which forms the protection layer which consists of an insoluble polymer membrane in this invention] It is preferred to contain a pressure sensitive adhesive 0.1 to 25%, and also to contain urethane diacrylate, saturation alkylene diethylene glycol diacrylate of the carbon numbers 2-6, and the bird acrylate derivative of TORIMECHI roll propane 75 in allweight % or more.

[0014]And in this invention, it is preferred to use applied type adhesives or the adhesive of pressure sensitive adhesive tape for a pasting adhesive line.

[0015]When a substrate is fabricated by injection molding process using a ring-shaped stamper and also a substrate is fabricated in this invention, [a stamper] It is fixed to a metallic mold of a making machine in a stamper control inner circumference mounting part, and the inner circumference side, [on a substrate] The Records Department is fabricated rather than a stamper control inner circumference mounting part at the perimeter side, and also adjoin the Records Department and the non-Records Department is fabricated at the perimeter side, A pair of substrates have [in / a part / at least / a field of until] a thing of the non-Records Department of the perimeter side which adjoined the Records Department and the Records Department from inner circumference more preferred than a stamper control inner circumference mounting part stuck.

[0016]Or in this invention, a substrate is fabricated by injection molding process again using a ring-shaped stamper, And when the near surface where a substrate irradiates with light of information used for read-out at least is flat and also a substrate is fabricated, [a stamper] As for thickness of a substrate which is fixed to a metallic mold of a making machine in a stamper control inner circumference mounting part, and is fabricated rather than a stamper control inner circumference mounting part in the inner circumference side at the inner circumference side, it is more preferred than a stamper control inner circumference mounting part that it is below thickness of a substrate fabricated at the perimeter side.

[0017]When manufacturing an optical recording medium of this invention, [a method of pasting a pair of substrates together] Although not limited in particular, the pasting-up method by press, hand roller, a platen, etc. is used, for example, Even if it is preferred to carry out by pressurizing as for this adhesion, a convex part of the shape of some barricade is in a substrate inner periphery and a crevice produces in a disk inner periphery, Pasting which secured the smoothness of a disk is realizable by raising adhesion of a protective film in the outermost layer by the side of an optical disc record side which is an adherend, and adhesives used for sticking and an adhesive of an adhesive tape.

[0018]Namely, although the protective film of the outermost layer used for this invention is

formed by the crosslinking reaction of a reactive resin mixture, [a protective film] A main ingredient Tolylene diisocyanate, isophorone diisocyanate, diphenylmethane diisocyanate, dicyclohexylmethane diisocyanate, Or one kind of the isocyanate derivative chosen from diphenyl ether diisocyanate, Or the urethane diacrylate which carried out the diacrylate of urethane JIORU stoichiometrically obtained at a reaction with saturation alkylene diethylene glycol of the superfluous carbon numbers 2-6 to the mixture and isocyanate derivative, It is a reactive resin mixed-solution which are saturation alkylene diethylene glycol diacrylate of the carbon numbers 2-6, and a bird acrylate derivative of TORIMECHI roll propane, and the target mixed-solution can be obtained by adding an acrylate ester component to this.

[0019][as a pressure sensitive adhesive added in this mixture] The glass transition point of the homopolymer of the main composition monomer contained not less than 80% is 0 ** or less, For example, the pressure sensitive adhesive of a silicone series in which rubber pressure sensitive adhesive, such as crude rubber and styrene butadiene copolymerization rubber, and a carbon number have the siloxane bond which used as the base the acrylic ester system adhesion material which has a saturated hydrocarbon fatty acid machine of 2 to 8 and the methyl group, or the phenyl group is used.

[0020]As an adhesion grant agent, oil nature resin, such as polyterpene resin, such as rosin derivative resin, such as abietic acid, PIMARU acid, and JITERUPENOIDO, pinene, and limonene, and PIPERIREN, styrene, indene, and dicyclopentadiene, may be used together and used.

[0021][in this invention] [as the application of the adhesives to a DVD board, and the method of uniting sticking] A method by the roll coat method using hot melt adhesive, such as polyethylene, PVA, polyamide, and polyester resin, A method by the spin coat method using UV hardening adhesives, such as radical polymerization type acrylic resin, There is a method by the method using pressure sensitive adhesive tape, such as a method by the screen printer method using UV hardening type adhesives, such as cationic polymerization type epoxy system resin, and a rubber system, a silicone series, and acrylic resin.

[0022]Since, as for double-sided type DVD-RAMs, a recording layer or a reflecting layer cannot penetrate ultraviolet rays easily here, Rather than using the method according ultraviolet curing adhesives, such as radical polymerization type acrylic resin which carries out an ultraviolet exposure after sticking a disk, to a spin coat method, The method by the roll coat method using hot melt adhesive, the method according cationic polymerization ***** type UV hardening type adhesives to a screen printer method, and the method by the method using pressure sensitive adhesive tape are suitable.

[0023]In this invention, [as composition of an erasable optical recording medium] For example, the 1st dielectric layer, a recording layer, the 2nd dielectric layer, and a reflecting layer were provided in one transparent substrate at this order, resin protection layers, such as

a UV-cured resin layer which contained the pressure sensitive adhesive on it, were laminated, a pasting adhesive line is provided, and also this is pasted together to other substrates, and it is obtained by things.

[0024]As a substrate, when performing record and elimination from the substrate side, it is preferred to use the material which a laser beam penetrates, for example, polymer resin or inorganic glass, such as polycarbonate resin, polymethyl methacrylate resin, an epoxy resin, and poly amorphous olefin resin, etc. is used.

[0025]A dielectric layer plays the role of the nonproliferation layer for which a substrate, a recording layer, etc. prevent the modification prevention for which record / elimination characteristic is prevented from changing by record and deteriorating with heat, the protection which gives the resistance to moist heat and the oxidation-resistant effect of a recording layer, and the atomic diffusion to a reflecting layer from a recording layer. As such a dielectric layer, inorganic films and those mixed films, such as ZnS, SiO₂, Ta₂O₅, ITO, Si₃N₄, and TiO₂, can be used, for example. Since especially the mixed film of ZnS and SiO₂ is excellent in resistance to moist heat and also controls degradation of the recording layer by repetition of record and elimination, it is preferred.

[0026]It is desirable as a phase change type optical recording medium with which what has a quick crystallization speed performs record and elimination as a recording layer, for example, a GeSbTe system thin film, an InSbTe system thin film, etc. are mentioned. The recording layer containing GeSbTe which is excellent in especially the repetition characteristic is preferred.

[0027]A reflecting layer makes formation of an amorphous mark easy by raising the cooling rate of the recording layer which made thermal diffusion from a dielectric layer easy, and carried out melting at the time of record. There are an effect that a protection layer etc. prevent changing thermally, and an effect of improving the contrast of a reproduction signal by optical interference. As such a reflecting layer, it has light reflex nature and absorbency on the wavelength of a laser beam, And the metal or the metal oxide whose degree of heat conduction is higher than a protection layer, metal nitride, What mixed metal, such as metallic carbide, etc. a metaled mixture, for example, Zr, Hf, Ti, Ta, Mo, Si, aluminum, Au, and Cr, these alloys, these and Si oxide, Si nitriding thing, aluminum oxide, etc. can be used. There are especially aluminum, Au, Ta(s), those alloys, etc. in light reflex nature being high and being able to make thermal conductivity high by material selection.

[0028]

[Work example 1][first, / the / a transparent substrate/] -- [of one / the / the dielectric layer / recording layer /] -- the phase change type optical recording medium which consists of composition of the ultraviolet curing type protection layer containing the dielectric layer / reflecting layer / pressure sensitive adhesive of two was produced.

[0029]Therefore, Teijin Chemicals polycarbonate resin (brand name AD5503) was used for the

transparent substrate as materials. With and the injection molding machine by NISSEI PLASTIC INDUSTRIAL CO., LTD. (model name: MO40D3H), With disk 0.6 mm in thickness, and the diameter of a disk of 120 mm, attach the stamper of a DVD Specifications for DVD-RAM (Version 1.0.July 1997) format with a storage capacity of 2.6 GB, and The pit for tracking, The transparent substrate with a groove was created.

[0030]In order to maintain the substrate performance which makes smooth the flow from the gate section of a metallic mold, reduces remaining stress, and is represented by the double reflex good, Since tool temperature was set as about 120 ** and high temperature in order that 10 micrometers of non-Records Department of the inner circumference of the part of stamper control of this substrate might be low set up to the Records Department, a peripheral part, and might raise the transfer nature of a stamper pattern, a 1-100-micrometer barricade has occurred in the direction of a circumference of inner control of a stamper.

[0031]The 1st transparent dielectric layer is ZnS-SiO₂ (150 nm of film thickness).

It formed by magnetron sputtering on the transparent substrate.

A recording layer is germanium₂Sb₂Te₅ (25 nm of film thickness). The 2nd transparent dielectric protection layer is ZnS-SiO₂ (50 nm of film thickness). A reflecting layer is aluminum (100 nm of film thickness).

[0032]An organic protection layer is ultraviolet curing type reactive resin which comprises diacrylate of the urethane which consists of a JIREN glycol and tolylene diisocyanate, PENTA erythritol tetraacrylate, neopentyl glycol diacrylate, and trimethylolpropane triacrylate.

The ultraviolet curing type protection layer of 10-micrometer film thickness was formed with the spin coat method as a protection layer which consists of an insoluble polymer membrane using the coating liquid which added 10 weight % for acrylic acid iso octyl as a pressure sensitive adhesive into the resinous principle concerned.

It carried out to hardening in irradiation time 15 seconds using the 3-kW high-pressure mercury lamp at that time.

[0033]The medium obtained in this way was pasted together to other substrates. Therefore, acrylic acid iso octyl, acrylic acid, and the adhesion material that used and created trimethylolpropane triacrylate as a crosslinking agent were stuck using pressure sensitive adhesive tape as base polymer of 50-micrometer thickness on the protection layer which consists of an insoluble polymer membrane of the medium which created [above-mentioned] first of all. the transparent substrate (a dielectric layer.) created by the method more nearly same than the upper part as the above Only the disk which applied and carried out ultraviolet curing of the organic protection layer which is carrying out sputtering of a record film layer and the reflecting layer, and added the pressure sensitive adhesive nothing to be with the spin coat method was piled up, and it carried out by being stuck by pressure using a hand roller.

[0034]It created continuously, and when ten existence of the air bubbles between the disks which stick visually and originate badly from the direction of the transparent substrate of the double-sided disk obtained by sticking was investigated, it is only two sheets that the air bubbles of the micron order have been observed, and air bubbles were not observed at all by other eight sheets.

[0035]

[Comparative example 1] Except not having added the acrylic acid iso octyl of the pressure sensitive adhesive in the organic protection layer of the substrate of both upper and lower sides to stick, the same processing was performed, it stuck and the disk was created. When ten existence of the air bubbles between the disks which stick visually and originate badly from the direction of the transparent substrate of the double-sided disk obtained by creating continuously and sticking is investigated, it is only two sheets that air bubbles were not observed, Air bubbles are observed by other eight sheets and the air bubbles of the size of a milli meter order level came to be observed by many substrates.

[0036]

[Effect of the Invention]It becomes possible to strengthen adhesion with adhesives, if used for sticking with the organic protection layer of the disk stuck by adding a pressure sensitive adhesive in an organic protection layer, It becomes easy for an adhesion side to create of the disk in which air bubbles decreased in number, the machinery characteristic is maintained good, and pasting of a DVD disk with good smoothness can be realized.

[Translation done.]